



# Central Coastal Plain Water Use Study



Revised 7/04

# 2002

***The Central Coastal Plain Water Use Area (CCPCUA)*** survey was conducted to document water use for the agricultural sector in Beaufort, Carteret, Craven, Duplin, Edgecombe, Greene, Jones, Lenoir, Martin, Onslow, Pamlico, Pitt, Washington, Wayne, and Wilson counties. CCPCUA and associated rules were created in May, 2001 to help manage water resources within the 15 county area (General Statute 143-215-22H). Because limited information was available on agricultural water use, the North Carolina Department of Agriculture and Consumer Services was requested to collect information from farmers that withdraw 10,000 to 100,000 gallons in any one day. Individual responses remain confidential and are only used in combination with other reports to produce county totals.

Farmers that use in excess of 100,000 gallons in any one day are required to report their water usage directly to the Department of Environment and Natural Resources (DENR). Data for 2002 were furnished by DENR and are included in the last page of this report.

Of the 5,973 farms surveyed, only 314 in the 15 county area withdrew between 10,000 and 100,000 gallons of water in any one day. June was the largest water use month averaging 5.05 million gallons of ground water and 43.2 million gallons of surface water per day. Maximum daily withdrawal capacity for ground and surface water totaled 106.3 million gallons.

A questionnaire was mailed in mid-December 2002 to 5,973 potential farming operations in the 15 county area. Operations that did not respond were sent a second questionnaire and were contacted by telephone if their water use information was not received by mail. Data collection was finalized in early March. The table below quantifies the response of the 5,973 farms. For the 142 non-response operations and the 73 refusals, the size and type of operation for each was reviewed, and determined that the farms were unlikely to withdraw 10,000 gallons per day.

1684	mail
3151	phone
73	refusal
142	non-response
649	agri-business
274	out of business

For each county, the total number of operations by type with total and average daily withdrawal capacity was summarized by month. The type of operations will not add to the total in all counties, because some operations had irrigated cropland and livestock. The daily withdrawal capacity is the potential amount of ground and/or surface water that could be utilized in a 24 hour period. In nearly all cases, this capacity was never met. Data was not disclosed if there were less than three operations in any category or if one report comprised more than 60 percent of the total. Water use data for Carteret, Edgecombe and Pamlico counties were combined and summarized in the Other County table to avoid disclosure of individual data. Water use data for Martin and Wilson counties were included in the other county summary from January to May and October to December but published individually June to September.

## *Central Coastal Plain Total Water Use by Month 2002\*\**

Month	# Operations	Total Avg Daily-Ground	Total Avg Daily-Surface	Total Max Daily-Ground	Total Max Daily-Surface
<i>gallons</i>					
Jan	176	2,369,221	1,288,790	3,052,623	1,326,000
Feb	183	2,475,708	1,429,550	3,153,464	1,496,000
March	195	2,887,374	1,726,070	3,666,590	1,823,760
April	210	3,303,190	6,048,854	4,189,099	6,489,364
May	237	3,938,320	22,205,908	4,963,797	29,267,388
June	269	5,053,872	43,233,863	6,172,900	50,565,971
July	282	5,617,843	36,993,443	6,830,971	74,498,500
Aug	245	4,820,987	25,283,835	5,987,555	46,987,277
Sept	202	4,202,644	7,644,633	5,317,756	8,779,559
Oct	196	3,417,141	1,381,594	4,530,838	1,726,904
Nov	180	2,776,970	1,368,790	3,607,327	1,432,000
Dec	177	2,596,442	1,666,790	3,316,155	1,728,000

\*\* revised

### Operations:

314  
total operations

171  
livestock

151  
irrigation

9  
aquaculture

### Daily Withdrawal Capacity (incl. ground and surface) :

106,274,540 total (gallons)

Total Water Use

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## *Beaufort - Water Use by Month 2002*

Month	# Operations	Avg # Days	Total Avg Daily-Ground	Total Avg Daily-Surface	Total Max Daily-Ground	Total Max Daily-Surface
<i>gallons</i>						
Jan	5	31	116,400	0	131,600	0
Feb	5	28	119,400	0	128,400	0
March	7	24	185,900	0	193,800	0
April	6	26	175,000	0	185,200	0
May	6	27	162,900	0	181,600	0
June	7	23	185,400	*	198,700	*
July	7	23	216,300	*	225,000	*
Aug	7	23	189,600	*	207,400	*
Sept	7	23	232,000	0	243,700	0
Oct	6	26	164,800	0	187,200	0
Nov	5	30	126,900	0	139,600	0
Dec	5	31	132,800	0	142,600	0

\* disclosure - one operation is greater than 60% of total OR less than 3 operations.

### Operations:

8  
total operations

5  
livestock

3  
irrigation and aquaculture

### Daily Withdrawal Capacity (incl. ground and surface):

555,616 total (gallons)

County Water Use

## *Craven - Water Use by Month 2002*

Month	# Operations	Avg # Days	Total Avg Daily-Ground	Total Avg Daily-Surface	Total Max Daily-Ground	Total Max Daily-Surface
<i>gallons</i>						
Jan	8	31	122,286	0	183,395	0
Feb	9	25	122,285	*	183,395	*
March	11	24	229,899	*	297,527	*
April	11	24	234,173	*	313,208	*
May	12	24	217,940	*	305,123	*
June	13	23	244,265	1,591,987	339,597	1,731,987
July	14	25	268,712	1,182,237	369,747	1,322,237
Aug	12	24	234,744	741,520	335,779	881,520
Sept	10	27	184,237	*	282,013	*
Oct	10	27	192,070	*	281,698	*
Nov	9	27	141,559	*	214,076	*
Dec	9	28	127,792	*	192,161	*

\* disclosure - one operation is greater than 60% of total OR less than 3 operations.

### Operations:

8  
total operations

8  
livestock and irrigation

### Daily Withdrawal Capacity (incl. ground and surface):

2,955,859 total (gallons)

## *Duplin- Water Use by Month 2002\*\**

Month	# Operations	Avg # Days	Total Avg Daily-Ground	Total Avg Daily-Surface	Total Max Daily-Ground	Total Max Daily-Surface
<i>gallons</i>						
Jan	88	30	1,127,343	*	1,547,564	*
Feb	89	27	1,166,182	*	1,596,347	*
March	89	30	1,276,827	*	1,750,268	*
April	89	29	1,536,861	*	2,069,791	*
May	92	30	1,675,561	*	2,265,424	*
June	96	29	1,954,995	*	2,597,251	*
July	93	30	2,011,842	*	2,695,094	*
Aug	93	30	2,009,268	*	2,727,609	*
Sept	90	29	1,873,986	*	2,554,176	*
Oct	90	30	1,672,038	*	2,312,183	*
Nov	89	29	1,353,851	*	1,873,433	*
Dec	89	30	1,211,538	*	1,673,681	*

\* disclosure - one operation is greater than 60% of total OR less than 3 operations.

\*\* revised

### Operations:

97  
total operations

92  
livestock and aquaculture

12  
irrigation

### Daily Withdrawal Capacity (incl. ground and surface):

11,405,624 total (gallons)

## *Greene - Water Use by Month 2002\*\**

Month	# Operations	Avg # Days	Total Avg Daily-Ground	Total Avg Daily-Surface	Total Max Daily-Ground	Total Max Daily-Surface
<i>gallons</i>						
Jan	10	31	108,520	0	151,651	0
Feb	11	26	111,576	0	150,567	0
March	11	29	120,080	0	160,359	0
April	12	27	142,818	*	194,080	*
May	14	25	140,533	*	196,745	*
June	19	22	454,829	*	512,007	*
July	20	22	372,689	*	445,365	*
Aug	17	25	176,467	*	236,503	*
Sept	10	30	169,682	0	238,629	0
Oct	10	31	145,220	0	199,903	0
Nov	10	30	124,495	0	166,324	0
Dec	10	31	122,126	0	156,432	0

\* disclosure - one operation is greater than 60% of total OR less than 3 operations.

\*\* revised

### Operations:

21  
total operations

6  
livestock and aquaculture

14  
irrigation

### Daily Withdrawal Capacity (incl. ground and surface):

7,341,506 total (gallons)

County Water Use



## *Jones - Water Use by Month 2002\*\**

Month	# Operations	Avg # Days	Total Avg Daily-Ground	Total Avg Daily-Surface	Total Max Daily-Ground	Total Max Daily-Surface
<i>gallons</i>						
Jan	11	31	241,658	0	239,225	0
Feb	12	26	252,704	0	269,654	0
March	12	29	260,249	0	278,908	0
April	13	27	294,984	0	324,462	0
May	12	29	316,549	0	344,531	0
June	12	28	338,312	0	368,457	0
July	12	29	358,135	0	389,519	0
Aug	13	27	337,587	0	398,377	0
Sept	11	30	335,559	0	362,178	0
Oct	11	31	310,366	0	339,752	0
Nov	11	30	269,424	0	295,893	0
Dec	11	31	243,344	0	260,324	0

*\*\*revised*

### Operations:

14  
total operations

12  
livestock

3  
irrigation

### Daily Withdrawal Capacity (incl. ground and surface):

414,635 total (gallons)



## *Lenoir - Water Use by Month 2002\*\**

Month	# Operations	Avg # Days	Total Avg Daily-Ground	Total Avg Daily-Surface	Total Max Daily-Ground	Total Max Daily-Surface
<i>gallons</i>						
Jan	5	31	62,725	0	71,423	0
Feb	6	24	68,221	0	73,310	0
March	5	31	61,661	0	67,093	0
April	9	22	94,497	*	102,952	*
May	11	20	94,531	*	107,862	*
June	13	17	127,152	2,102,927	140,151	2,416,847
July	13	16	165,414	2,931,110	186,386	3,245,030
Aug	8	24	140,098	*	160,449	*
Sept	8	20	97,946	*	112,164	*
Oct	6	27	75,071	0	73,218	0
Nov	5	30	69,262	0	76,238	0
Dec	5	31	71,994	0	82,758	0

\* disclosure - one operation is greater than 60% of total OR less than 3 operations.

\*\*revised

### Operations:

17  
total operations

6  
livestock and aquaculture

12  
irrigation

### Daily Withdrawal Capacity (incl. ground and surface):

4,853,428 total (gallons)

County Water Use

## *Martin - Water Use by Month 2002 <sup>1</sup>*

Month	# Operations	Avg # Days	Total Avg Daily-Ground	Total Avg Daily-Surface	Total Max Daily-Ground	Total Max Daily-Surface
<i>gallons</i>						
Jan						
Feb						
March						
April						
May						
June	10	14	323,360	*	381,360	*
July	11	13	323,360	*	381,360	*
Aug	9	12	251,360	*	309,360	*
Sept	5	16	241,360	*	299,360	*
Oct						
Nov						
Dec						

\* disclosure - one operation is greater than 60% of total OR less than 3 operations.

<sup>1</sup> Jan through May and Oct through Dec combined with other counties to avoid disclosure.

### Operations:

12  
total operations

13  
irrigation and aquaculture

### Daily Withdrawal Capacity (incl. ground and surface):

38,217,176 total (gallons)

## *Onslow - Water Use by Month 2002\*\**

Month	# Operations	Avg # Days	Total Avg Daily-Ground	Total Avg Daily-Surface	Total Max Daily-Ground	Total Max Daily-Surface
<i>gallons</i>						
Jan	5	26	53,200	*	53,200	*
Feb	5	23	53,200	*	53,200	*
March	6	25	53,200	235,760	53,200	235,760
April	7	20	53,200	248,608	53,200	248,608
May	9	18	121,080	471,520	150,776	800,000
June	11	17	117,504	*	147,200	*
July	12	19	132,504	*	162,200	*
Aug	9	21	78,200	954,560	78,200	1,040,000
Sept	7	21	53,200	1,497,600	53,200	1,640,000
Oct	5	28	53,200	100,000	53,200	100,000
Nov	5	27	53,200	100,000	53,200	100,000
Dec	5	26	53,200	100,000	53,200	100,000

\* disclosure - one operation is greater than 60% of total OR less than 3 operations.

\*\*revised

### Operations:

13  
total operations

7  
livestock

7  
irrigation

### Daily Withdrawal Capacity (incl. ground and surface):

3,983,854 total (gallons)

County Water Use

## *Pitt - Water Use by Month 2002\*\**

Month	# Operations	Avg # Days	Total Avg Daily-Ground	Total Avg Daily-Surface	Total Max Daily-Ground	Total Max Daily-Surface
<i>gallons</i>						
Jan	8	25	123,869	*	148,581	*
Feb	9	21	141,353	*	166,065	*
March	8	26	133,398	*	160,954	*
April	10	23	167,450	*	199,383	*
May	12	24	366,337	*	401,825	*
June	17	19	382,491	5,163,838	425,016	5,209,848
July	19	21	466,499	5,894,490	518,363	5,940,500
Aug	17	21	504,034	1,558,090	553,915	1,604,100
Sept	11	22	286,983	*	335,642	*
Oct	9	25	175,606	*	213,310	*
Nov	8	27	135,487	*	164,775	*
Dec	8	28	126,358	*	152,891	*

\* disclosure - one operation is greater than 60% of total OR less than 3 operations.

\*\*revised

### Operations:

24  
total operations

9  
livestock and aquaculture

16  
irrigation

### Daily Withdrawal Capacity (incl. ground and surface):

7,627,962 total (gallons)

County Water Use

## *Washington - Water Use by Month 2002*

Month	# Operations	Avg # Days	Total Avg Daily-Ground	Total Avg Daily-Surface	Total Max Daily-Ground	Total Max Daily-Surface
<i>gallons</i>						
Jan	9	31	129,210	0	219,657	0
Feb	9	28	129,210	0	219,657	0
March	9	31	142,992	0	243,087	0
April	9	30	167,112	0	284,090	0
May	9	31	184,340	0	313,377	0
June	9	30	201,568	0	342,665	0
July	9	31	213,627	0	363,166	0
Aug	10	29	213,627	*	363,166	*
Sept	9	30	206,736	0	351,451	0
Oct	9	31	189,508	0	322,164	0
Nov	9	30	153,329	0	260,660	0
Dec	9	31	136,101	0	231,372	0

\* disclosure - one operation is greater than 60% of total OR less than 3 operations.

### Operations:

10  
total operations

10  
livestock and irrigation

### Daily Withdrawal Capacity (incl. ground and surface):

383,530 total (gallons)

County Water Use

## Wayne - Water Use by Month 2002\*\*

Month	# Operations	Avg # Days	Total Avg Daily-Ground	Total Avg Daily-Surface	Total Max Daily-Ground	Total Max Daily-Surface
<i>gallons</i>						
Jan	24	31	342,187	0	418,387	0
Feb	24	28	356,173	0	411,358	0
March	25	29	380,376	0	454,214	0
April	27	28	451,971	*	529,751	*
May	31	27	590,486	*	694,483	*
June	33	27	741,939	*	823,196	*
July	43	23	1,031,861	1,565,793	1,124,166	1,857,374
Aug	32	27	758,392	464,356	774,202	701,462
Sept	28	28	597,228	*	647,882	*
Oct	27	29	442,843	*	563,829	*
Nov	25	28	415,518	0	493,215	0
Dec	24	31	426,715	0	481,969	0

\* disclosure - one operation is greater than 60% of total OR less than 3 operations.

\*\*revised

### Operations:

45  
total operations

24  
livestock and aquaculture

23  
irrigation

### Daily Withdrawal Capacity (incl. ground and surface):

4,230,829 total (gallons)

## *Wilson - Water Use by Month 2002 <sup>1</sup>*

Month	# Operations	Avg # Days	Total Avg Daily-Ground	Total Avg Daily-Surface	Total Max Daily-Ground	Total Max Daily-Surface
<i>gallons</i>						
Jan						
Feb						
March						
April						
May						
June	19	18	57,343	6,430,403	59,147	6,744,923
July	19	18	102,426	5,007,043	103,169	5,331,123
Aug	13	20	58,286	2,902,279	60,290	2,904,239
Sept	6	24	59,576	2,036,744	61,147	2,037,184
Oct						
Nov						
Dec						

<sup>1</sup> Jan through May and Oct through Dec combined with other counties to avoid disclosure.

### Operations:

23  
total operations

3  
livestock

21  
irrigation

### Daily Withdrawal Capacity (incl. ground and surface):

9,009,698 total (gallons)



## *Other Counties- Water Use by Month 2002 <sup>1</sup>*

Month	# Operations	Avg # Days	Total Avg Daily-Ground	Total Avg Daily-Surface	Total Max Daily-Ground	Total Max Daily-Surface
<i>gallons</i>						
Jan	10	27	64,109	*	71,335	*
Feb	11	21	77,689	*	84,906	*
March	19	17	272,691	1,458,800	304,707	1,522,000
April	23	14	219,297	3,329,824	246,190	3,487,224
May	34	15	286,003	13,267,084	307,174	19,111,150
June	23	12	168,979	12,983,867	177,750	13,702,415
July	24	16	223,186	11,896,783	237,183	12,479,929
Aug	17	16	104,068	10,339,424	118,084	11,057,550
Sept	10	19	48,388	3,754,824	58,227	4,462,000
Oct	19	15	188,489	1,087,184	266,079	1,160,904
Nov	11	18	75,504	1,237,280	83,989	1,266,000
Dec	10	24	72,266	1,535,280	80,928	1,562,000

\* disclosure - one operation is greater than 60% of total OR less than 3 operations.

<sup>1</sup> (revised) Jan - May and Oct - Dec include Carteret, Edgecombe, Pamlico, Martin, and Wilson counties.

<sup>1</sup> (revised) June - Sept include Carteret, Edgecombe, and Pamlico counties.

<sup>2</sup> avg # days is the avg of the multiple county averages.

### **Operations in Carteret, Craven, Edgecombe, and Pamlico counties:**

30  
total operations

4  
livestock

29  
irrigation

### **Operations in Carteret, Edgecombe, Martin, Pamlico and Wilson counties:**

65  
total operations

9  
livestock and aquaculture

61  
irrigation

### **Daily Withdrawal Capacity (incl. ground and surface) for Carteret, Edgecombe, and Pamlico:**

18,250,682 total (gallons)

### **Daily Withdrawal Capacity (incl. ground and surface) for Carteret, Edgecombe, Martin, Pamlico and Wilson:**

106,274,540 total (gallons)

Other Counties Water Use

## ***Department of Environment and Natural Resources - Water Use Exceeding 100,000 Gallons Per Day <sup>1</sup> (permit required)***

Farmers that use in excess of 100,000 gallons of ground water in any one day are required to obtain a permit from the Department of Environment and Natural Resources. Fifty agricultural operations have applied for these permits. To date, thirty-nine permits have been issued. The remaining 11 operations have permits pending. One of the pending permits was not operating in 2002.

### Permits Issued:

23 aquaculture operations with 33,340,000 gallons per day permitted capacity  
2,904,897,863 gallons total reported usage in 2002

16 agricultural irrigation operations <sup>2</sup> with 21,836,000 gallons per day permitted capacity  
232,829,000 gallons total reported usage in 2002

### Pending Permits:

3 aquaculture operations and 7 agricultural irrigation operations

Month	# Operations	Avg. # Days	Total Avg. Daily(gal)
Jan	6	18	222,122
Feb	6	18	225,427
March	7	19	251,729
April	8	20	332,124
May	9	21	444,085
June	10	23	518,628
July	10	22	439,538
Aug	9	23	379,497
Sept	8	23	371,374
Oct	7	21	342,397
Nov	7	16	316,195
Dec	7	13	256,219

<sup>1</sup> Data supplied by Department of Environment and Natural Resources. The data is for calendar year 2002.

<sup>2</sup> Includes irrigators and operations with a combination of irrigation, aquaculture, and/or livestock.

